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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-28* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-4, 8-13 and 17-28* is/are rejected.

7) ☒ Claim(s) *5-7 and 14-16* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *16 March 2004* is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some *   c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____.

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date *3/16/2004*.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination

purposes, unless otherwise noted.

Drawings

1.   The drawings are objected to under 37 CFR 1.83(a) because of the following:

(i) FIG. 5 fails to show a thorough description of elements 110 through 160 as described

in the specification – suggest placing

"image input device" within box 110;

"color transformation device" within box 120;

"edge detector" within box 130;

"processing unit" within box 140;

"feedback unit" within box 150; and

"grayscale output unit" within box 160.

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they

include the following reference character(s) not mentioned in the description: "50".

3.   Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the

specification to add the reference character(s) in the description in compliance with 37 CFR

1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as either

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4.   The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.

(b) CROSS-REFERENCE TO RELATED APPLICATIONS.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR

DEVELOPMENT.

(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A

COMPACT DISC.

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97

and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence

Listing" is required on paper if the application discloses a nucleotide or amino

acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence

Listing" is not submitted as an electronic document on compact disc).

Claim Objections

5.   The following is a quotation of 37 CFR 1.75(a):

The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

6.   **Claim 5** is objected to because of the following informalities:

(i) Claim 5, line 4 is confusing when stating "wherein the sign factor is one when the

polarity" and may have possible interpretations – suggest changing "wherein the sign

factor is positive one when the polarity".

Appropriate correction is required.

7.   The following is a quotation of 37 CFR 1.75(d)(1):

The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

8.   **Claim 28** is objected to under 37 CFR 1.75(d)(1), as failing to conform to the invention

as set forth in the remainder of the specification.

9.   MPEP section 608.01(m) FORM OF CLAIMS states the following:

> While there is no set statutory form for claims, the present Office practice is to insist that each claim must
> be the object of a sentence starting with "I (or we) claim," "The invention claimed is" (or the equivalent).
> If, at the time of allowance, the quoted terminology is not present, it is inserted by the Office of Patent
> Publication.

The applicant is advised to add "I (or we) claim," "The invention claimed is" (or the

equivalent) to the first claim sheet.

Claim Rejections - 35 USC § 101

10.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions
> and requirements of this title.

11.   The USPTO "Interim Guidelines for Examination of Patent Applications for Patent

Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as

follows:

> Nonfunctional descriptive material that does not constitute a statutory process, machine, manufacture or
> composition of matter and should be rejected under 35 U.S.C. Sec. 101. Certain types of descriptive material,
> such as music, literature, art, photographs and mere arrangements or compilations of facts or data, without any
> functional interrelationship is not a process, machine, manufacture or composition of matter. USPTO personnel
> should be prudent in applying the foregoing guidance. Nonfunctional descriptive material may be claimed in
> combination with other functional descriptive multi-media material on a computer-readable medium to provide
> the necessary functional and structural interrelationship to satisfy the requirements of 35 U.S.C. Sec. 101. The
> presence of the claimed nonfunctional descriptive material is not necessarily determinative of nonstatutory
> subject matter. For example, a computer that recognizes a particular grouping of musical notes read from
> memory and upon recognizing that particular sequence, causes another defined series of notes to be played,
> defines a functional interrelationship among that data and the computing processes performed when utilizing that
> data, and as such is statutory because it implements a statutory process.

12. **Claims 10** and **23** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 10 recites a "grayscale image generated by..." and claim 23 recites a "grayscale image created from a color image..." which does not impart functionality to a computer or computing device, and is thus considered nonfunctional descriptive material. Such nonfunctional descriptive material, in the absence of a functional interrelationship with a computer, does not constitute a statutory process, machine, manufacture or composition of matter and is thus non-statutory per se.

13. **Claims 1, 3 – 10,** and **22** are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter because the claimed invention is directed to a judicial exception and is not directed to a practical applicant of such judicial exception (though the claims produce what is considered a useful and concrete result, the claims <u>do not require any physical transformation</u> and the invention <u>does not produce a tangible result</u>).

MPEP SECTION 2106 (IV)(C)(2)(b)(2) titled "TANGIBLE RESULT" reads as follows:

> ...the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application.").

and MPEP SECTION 2106 (II)(C) reads as follows:

> As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. The following are examples of language that may raise a question as to the limiting effect of the language in a claim:
> - (A)   statements of intended use or field of use,
> - (B)   "adapted to" or "adapted for" clauses,
> - (C)   "wherein" clauses, or
> - (D)   "whereby" clauses.

14.   The method of independent **claim 1** is directed to the actions of "applying a high pass

filter" and "adjusting a luminance component" that could all be done on a hardware

implementation free from any "real-world result" as there could exist no real-world application

(unlike for example claim 2 directed to actually outputting to a display which would then induce

a tangible "real-world result").

The method of **claims 3 – 10** and **22** are directed to the further actions that could all be

done on a hardware implementation free from any "real-world result" as there could exist no

real-world application (unlike for example claim 2 directed to actually outputting to a display

which would then induce a tangible "real-world result").

Claim Rejections - 35 USC § 102

15.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a)'shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16.   **Claims 1 – 4, 9, 11 – 13, 19,** and **22 – 23** are rejected under 35 U.S.C. 102(b) as being

anticipated by Weston (US 5,434,627 A).

Regarding **claim 1**, Weston discloses a method ("The invention aims to reduce or

eliminate this residual cross talk between luminance and chrominance signals.", column 1, line

33.), comprising:

applying a high pass filter to at least one chrominance component of a color image to

compute at least one high pass filtered chrominance component ("The input to the line delay 144

is the luminances signal filtered by high pass filter F, 150 and added in adder 152 to the

chrominance signal filtered by high pass filter F, 154. Thus the filter F must be repeated for the

Y and C signals.", column 5, line 35. It is well known to one of ordinary skill in the art that

chrominance is a signal used in many video systems to carry the color information of the picture

separately from the accompanying luminance signal, and thus FIG. 7(a) discloses a color image

input. It must be noted that a grayscale image may also be considered a color image, in that the

shades of gray are distinct colors.), and

adjusting a luminance component of the color image based upon the at least one high

pass filtered chrominance component (FIG. 7(a) in combination with the same reference given

above. The luminance component of the color image is "adjusted" at adder 152 and subtractor

146.).

Regarding **claim 2**, Weston discloses the method of claim 1, further comprising

generating an output image based upon the adjusted luminance component (FIG. 7(a) discloses a

PAL output, as well as FIG. 7(b) disclosing the PAL channel transforming back into luminance

and chrominance. It is well known to one of ordinary skill in the art that the PAL (phase-

alternating line) is a color encoding system used in broadcast television systems, and is used

exclusively for outputting an image on a television.).

Regarding **claim 3**, Weston discloses the method of claim 1, further comprising

combining multiple high pass filtered chrominance components into a single chrominance

component before adjusting the luminance component ("Similarly the combination of the two

chrominance signals into a single signal (C=U+V/U-V) which is a feature of W-PAL creates

cross-talk between the two chrominance signals (which is reduced by the pre & post filters).",

column 2, line 19. Chrominance signals U and V are high passed as shown in FIG. 7(a)

(reference numeral 154) before adjusting the luminance component.).

Regarding **claim 4**, Weston discloses the method of claim 1, further comprising:

applying a high pass filter to a luminance component of the color image to compute a

high pass filtered luminance component (As in the reference given in claim 1 in combination

with FIG. 7(a), the luminance is split from which one channel is passed through high pass filter

150.); and

weighting the at least one high pass filtered chrominance component by a weighting

factor based upon the high pass filtered luminance component (As in the reference given in claim

1 in combination with FIG. 7(a), adder 152 adds the high-passed chrominance filter to the high-

passed luminance signal based upon the presence/existence of the high pass filtered luminance

component. The weighting factor has assumed to be the unit "1" for examination purposes.).

Regarding **claim 9**, Weston discloses the method of claim 1, further comprising

weighting the at least one high-pass-filtered chrominance component by a weighting factor based

upon a magnitude of the high pass filtered chrominance component (As in the reference given in

claim 1 in combination with FIG. 7(a), adder 152 adds the high-passed chrominance filter to the

high-passed luminance signal based upon the presence/existence of the high pass filtered

luminance component. The weighting factor has assumed to be the unit "1" for examination

purposes based on the magnitude of the high pass filtered chrominance component existing.).

Regarding **claim 11**, Weston discloses a system for converting a color image to a

grayscale image ("The invention aims to reduce or eliminate this residual cross talk between

luminance and chrominance signals.", column 1, line 33.), comprising:

an image input device that receives a color image having luminance and chrominance

components (FIG. 7(a) of Weston discloses the W-PAL assembler input device receiving

luminance and chrominance components);

an edge detector operably connected to the image input device, the edge detector

including a high pass filter for computing high-pass filtered chrominance components from the

received chrominance components ("The input to the line delay 144 is the luminances signal

filtered by high pass filter F, 150 and added in adder 152 to the chrominance signal filtered by

high pass filter F, 154. Thus the filter F must be repeated for the Y and C signals.", column 5,

line 35. Chrominance is a signal used in many video systems to carry the color information of

the picture separately from the accompanying luminance signal, and thus FIG. 7(a) discloses a

color image input. The edge detector in this case is the high pass filter itself.);

a feedback unit operably connected to the edge detector, wherein the feedback unit

modifies the luminance component based upon the high-pass filtered chrominance components

(Fig. 7(a) discloses delay unit 144 which inputs a luminance component based upon the high-

pass filtered chrominance components when added at adder 152); and

an output device operably connected to the feedback unit, wherein the output device

receives the modified luminance component and outputs a grayscale image based upon the

modified luminance component (Refer to claim 2, in addition to the possibility of the color

image consisting of colors making it strictly a grayscale image. Color is a broader scope than

shades of gray.).

Regarding **claim 12**, Weston discloses the system of claim 11, wherein the edge detector

combines multiple high-pass filtered chrominance, components into a single high-pass filtered

chrominance component (refer to reference cited in claim 3).

Regarding **claim 13**, Weston discloses the system of claim 12, further comprising a

processing unit operably connected to and between the edge detector and the feedback unit (FIG.

7A discloses an adder reference numeral 152 for processing the combination between the high

pass filtered chrominance and luminance signals, and hence can be called a "processing unit".

The adder is in between the high pass filter (edge detector) and the delay unit 144 (feedback

unit).);

wherein the edge detector is also used to compute a high pass filtered luminance

component from the received luminance component (FIG. 7A discloses a high pass filter for both

the chrominance and luminance signals (reference numerals 150 and 154). These two high pass

filters may be the same high pass filter as must be assumed for examination purposes.); and

wherein the processing unit weights the high-pass-filtered combined chrominance

component based upon the high pass filtered luminance component (As in the reference given in

claim 1 in combination with FIG. 7(a), adder 152 adds the high-passed chrominance filter to the

high-passed luminance signal based upon the presence/existence of the high pass filtered

luminance component. The weighting factor has assumed to be "1" for examination purposes.).

Regarding **claim 19**, Weston discloses the method of claim 11, wherein the output device

is a display screen (FIG. 7(a) discloses a PAL output, as well as FIG. 7(b) disclosing the PAL

channel transforming back into luminance and chrominance. It is well known to one of ordinary

skill in the art that the PAL (phase-alternating line) is a color encoding system used in broadcast

television systems, and is used exclusively for outputting an image on a television – hence a

display screen.).

Regarding **claim 22**, claims 1 and 2 recite identical features as in claim 22. Thus,

arguments/references equivalent to those presented above for claims 1 and 2 are equally

applicable to claim 22.

17.   **Claim 23** is rejected under 35 U.S.C. 102(b) as being anticipated by Balasubramanian et

al. (Gamut Mapping to Preserve Spatial Luminance Variations, The Journal of Imaging Science

and Technology September/October 2001, vol. 45, no. 5; p. 436-443).

Regarding **claim 23**, Balasubramanian discloses a grayscale image created from a color

image, wherein at least some pixels of the color image having the same color are mapped to

different grays in the grayscale image depending on the spatial surround of each pixel (right

column, 3rd paragraph, pg 436 starting with "The third category...).

18.   **Claim 10** is rejected under 35 U.S.C. 102(b) as being anticipated by Kamada et al. (US

6,347,156 B1).

Claim 10 is a product-by-process claim. As cited in MPEP 2113 PRODUCT-BY-

PRODUCT CLAIMS, "[e]ven though product-by-process claims are limited by and defined by

the process, determination of patentability is based on the product itself. The patentability of a

product does not depend on its method of production. If the product in the product-by-process

claim is the same as or obvious from a product of the prior art, the claim is unpatentable even

though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698,

227 USPQ 964, 966 (Fed. Cir. 1985).

Kamada discloses a grayscale image, as well as the grayscale image being created from a

color image ("If an input document image is a color image, it is converted into a gray-scale

image and further converted into a binary image with the resolution according to that of the input

image.", column 4, line 36).

19.   **Claim 28** is rejected under 35 U.S.C. 102(b) as being anticipated by Hamilton, Jr. et al.

(US 6,259,822 B1).

Hamilton discloses a method for enhancing edges between a first object and a second

object in a grayscale image created from a color image, comprising darkening the first object

near an edge between the two objects and lightening the second object near the edge between the

two objects as a function of the original color edge strength ("Conventional sharpening methods,

such as unsharp masking, achieve the appearance of edge sharpening by locally lightening the

lighter portion of an edge region and locally darkening the darker portion of an edge region. The

resulting increase in contrast provides the sharpening effect. Such methods can be applied to

black and white digital images as well as to colored digital images.", column 1, line 23 in

combination with FIG. 3.).

Claim Rejections - 35 USC § 103

20.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

21.   **Claims 8** and **17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Weston

(US 5,434,627 A) in combination with Daly et al. (US 5,987,169 A).

Regarding **claim 8**, while Weston discloses the method of claim 1 further comprising

converting information from the color image to a luminance-chrominance representation (refer to

references/arguments cited in claim 1), Weston does not teach the color image from an RGB

representation.

Daly et al. teaches a luminance/chrominance apparatus ("This disclosure deals with using

the luminance signal as a control for the processing of chrominance signals in order to prevent

chromatic blur", column 2, line 63) wherein the input color image is from an RGB representation

(FIG. 5 discloses the input image as an RGB representation before being converted luminance-

chrominance representation.).

It would have been obvious at the time the invention was made to one of ordinary skill in

the art for the method of Weston to represent an input color image as RGB as taught by Daly et

al., to represent the color image by a standard digital image format.

Regarding **claim 17**, while Weston discloses the method of claim 11, Weston does not

teach that the method further comprises a color transformation device operably connected to and

between the image input device and the edge detector, wherein the color transformation device

converts the color image from an RGB representation to a luminance-chrominance

representation.

Daly et al. teaches a luminance/chrominance apparatus ("This disclosure deals with using

the luminance signal as a control for the processing of chrominance signals in order to prevent

chromatic blur", column 2, line 63) comprising a color transformation device, wherein the color

transformation converts the color image from a RGB representation to a luminance-chrominance

representation (FIG. 5 in combination with "Signal 32 is transformed, block 40, by conventional

transformation algorithm T into a luminance image signal component (L) 42 and a pair of

chrominance image signal components 44,46 (C1, C2).", column 4, line 40.).

It would have been obvious at the time the invention was made to one of ordinary skill in

the art for the method of Weston to disclose a color transformation device operably connected to

and between the image input device and the edge detector to convert the color image from an

RGB representation to a luminance-chrominance representation as taught by Daly et al., to

represent the color image by a standard digital image format.

22.   **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Weston (US

5,434,627 A) in combination with Lee et al. (US 5,012,333 A).

Regarding **claim 18**, while Weston discloses the method of claim 11, Weston does not

teach the output device as a printer.

Lee et al. teaches a chrominance/luminance apparatus ("A basic system of an interactive

image processor...", column 5, line 15) wherein the output device is a printer (FIG. 3 in

combination with "The output image signals are then directed to the printer 20 for printing.",

column 6, line 1.).

It would have been obvious at the time the invention was made to one of ordinary skill in

the art for the method of Weston to use a printer as an output device as taught by Lee et al. to

view an image from the Weston method on paper.

23.   **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Weston (US

5,434,627 A) in combination with Berstis (US 6,518,948 B1).

Regarding **claim 20**, while Weston discloses the method of claim 11, Weston does not

teach the output device as electronic paper.

Bertstis teaches a multichromal twisting ball display ("It is an object of the present

invention to provide an electrical and magnetic, twisting ball display device made up of

spheroidal, multichromal balls.", column 1, line 65) that is applicable to electronic paper

("Another object of the present invention is to provide electronic paper with individually

addressable electret and magnetic balls. Yet another object of this invention is to provide paper-

like digitally addressed media that has various applications including, without limitation, a

colored display, a sheet of electronic paper, an overlay transparency, or an architectural screen.",

column 2, line 16.) and cites using chroma and luma input ("The above-described embodiment of

FIG. 6 is not meant to limit the present invention. A given spheroidal ball surface portion may be

black; white; clear (i.e., essentially transparent and without chroma); a transparent color (e.g.,

transparent red, blue, or green, as for certain additive color applications; transparent cyan,

magenta, or yellow, as for certain subtractive color applications); an opaque color of any hue,

saturation and luminance; any shade of gray, whether opaque or translucent; and so forth.",

column 6, line 5.)

It would have been obvious at the time the invention was made to one of ordinary skill in

the art for the method of Weston to use a multichromal twisting ball display applicable to

electronic paper as an output device to view an image from the Weston method on electronic

paper as taught by Bertstis.

24.   **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Weston (US

5,434,627 A) in combination with Yanaka (US 6,115,138 A).

Regarding **claim 21**, while Weston discloses the method of claim 11, Weston does not

teach the output device as a facsimile machine.

Yanaka teaches a chrominance/luminance apparatus ("...it is the object of the present

invention to provide an image forming apparatus for print and forming an image on a printing

medium...", column 2, line 8.) wherein the output device is a facsimile machine ("Furthermore,

the ink jet recording apparatus of the present invention can be employed not only as an image

output terminal of an information processing device such as a computer, but also as an output

device of a copying machine including a reader, and as an output device of a facsimile apparatus

having a transmission and receiving function.", column 23, line 34.).

It would have been obvious at the time the invention was made to one of ordinary skill in

the art for the method of Weston to use a facsimile machine as an output device as taught by

Yanaka to allow "a transmission and receiving function", column 23, line 38.

25.   **Claims 24 – 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton,

Jr. et al. (US 6,259,822 B1) in combination with Weston (US 5,434,627 A).

Regarding **claim 24**, while Hamilton, Jr. et al. discloses a method for enhancing edges of

objects in an image, wherein the color image includes a plurality of pixels ("This object is

achieved by a method of edge enhancing a digital image having pixels which reduces the

visibility of false edge contours, comprising the steps of:...", column 1, line 66), comprising:

adjusting a luminance component of a subset of the plurality of pixels ("FIG. 1D is a

graph depicting the application of the positive and negative boosts of FIG. 1C to the profile

shown in FIG. 1A;", column 2, line 42. FIG. 1D depicts a unsharp mask that adjusts the color of

edge pixels (subset of the plurality of pixels). It is well known to one of ordinary skill in the art

that if the color component of the image has been changed, the luminance component has also

changed.);

wherein the subset of plurality of pixels are proximate to an edge between one object and

another ("Shown in FIG. 1A is a one-dimensional edge profile, which is a graph of image pixel

code values plotted as a function of their position on a line running perpendicularly across an

edge feature in a digital image.", column 1, line 31.);

and wherein pixels not proximate to the edge are not adjusted ("The difference curve of

FIG. 1C is added to the original curve in FIG. 1A and this final curve, shown in FIG. 1D, depicts

the profile of the sharpened edge.", column 1, line 41. As shown in FIG. 1D, the pixels not

proximate to the edge are not adjusted.); and

generating an output image based upon the adjusted luminance component (The act of

"enhancing" a digital image from the reference given above constitutes generating an output

image from the unsharp mask as disclosed by Hamilton, Jr. et al.), Hamilton, Jr. et al. does not

teach adjusting a luminance component of a subset of the plurality of pixels based upon the

chrominance information of those same pixels.

Weston discloses a method ("The invention aims to reduce or eliminate this residual

cross talk between luminance and chrominance signals.", column 1, line 33.), that teaches

adjusting a luminance component of a subset of the plurality of pixels based upon the

chrominance information of those same pixels (refer to the references cited in claim 1).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made for the method of Hamilton, Jr. to adjust a luminance component of a subset of the

plurality of pixels based upon the chrominance information of those same pixels as taught by

Weston "...to reduce or eliminate this residual cross talk between luminance and chrominance

signals.", column 1, line 33.

Regarding **claim 25**, while Hamilton, Jr. et al. a method for improving an image

composed of a plurality of pixels ("This object is achieved by a method of edge enhancing a

digital image having pixels which reduces the visibility of false edge contours, comprising the

steps of:...", column 1, line 66), comprising:

selecting a subset of the plurality of pixels based upon at least one predetermined

criterion derived from a local spatial neighborhood of the plurality of pixels (As depicted in FIG.

1A through FIG. 1D, the subset of the plurality of pixels is based upon both their spatial position

of each other, as well as their difference in code value magnitude within their spatial position.);

adjusting a luminance component of a subset of the plurality of pixels ("FIG. 1D is a

graph depicting the application of the positive and negative boosts of FIG. 1C to the profile

shown in FIG. 1A;", column 2, line 42. FIG. 1D depicts a unsharp mask that adjusts the color of

edge pixels (subset of the plurality of pixels). It is well known to one of ordinary skill in the art

that if the color component of the image has been changed, the luminance component has also

changed.); and

generating an output image based upon the adjusted luminance component (The act of

"enhancing" a digital image from the reference given above constitutes generating an output

image from the unsharp mask as disclosed by Hamilton, Jr. et al.), Hamilton, Jr. et al. does not

teach adjusting a luminance component of a subset of the plurality of pixels based upon the

chrominance information of those same pixels.

Weston discloses adjusting a luminance component of a subset of the plurality of pixels

based upon the chrominance information of those same pixels (refer to the references cited in

claim 1) "...to reduce or eliminate this residual cross talk between luminance and chrominance

signals.", column 1, line 33.

It would have been obvious to one of ordinary skill in the art at the time the invention

was made for the method of Hamilton, Jr. to adjust a luminance component of a subset of the

plurality of pixels based upon the chrominance information of those same pixels as taught by

Weston "...to reduce or eliminate this residual cross talk between luminance and chrominance

signals.", column 1, line 33.

Regarding **claim 26**, Hamilton, Jr. et al. discloses wherein the at least one predetermined

criterion includes only selecting pixels in close proximity to an edge (Refer to references cited in

claim 25. The edge pixels selected to be unsharp masking as the output shown in FIG. 1D

discloses are in "close proximity" to the edge.).

Regarding **claim 27**, while Hamilton, Jr. et al. discloses a method for improving transformation of an image composed of a plurality of pixels ("This object is achieved by a method of edge enhancing a digital image having pixels which reduces the visibility of false edge contours, comprising the steps of:...", column 1, line 66), comprising:

determining which of the plurality of pixels are in close proximity to an edge (As depicted in FIG. 1A through FIG. 1D, the subset of the plurality of pixels is based upon both their spatial position of each other, as well as their difference in code value magnitude within their spatial position. The unsharp mask of FIG. 1C applied to this local neighborhood of pixels will determine which are in close proximity to an edge when those specific pixels are affected by the unsharp mask.);

adjusting a luminance component of a subset of the plurality of pixels ("FIG. 1D is a graph depicting the application of the positive and negative boosts of FIG. 1C to the profile shown in FIG. 1A;", column 2, line 42. FIG. 1D depicts a unsharp mask that adjusts the color of edge pixels (subset of the plurality of pixels). It is well known to one of ordinary skill in the art that if the color component of the image has been changed, the luminance component has also changed.); and

generating an output image based upon the adjusted luminance component (The act of "enhancing" a digital image from the reference given above constitutes generating an output image from the unsharp mask as disclosed by Hamilton, Jr. et al.), Hamilton, Jr. et al. does not teach adjusting a luminance component of a subset of the plurality of pixels based upon the chrominance information of those same pixels.

Weston discloses a method ("The invention aims to reduce or eliminate this residual

cross talk between luminance and chrominance signals.", column 1, line 33.), that teaches

adjusting a luminance component of a subset of the plurality of pixels based upon the

chrominance information of those same pixels (refer to the references cited in claim 1).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made for the method of Hamilton, Jr. to adjust a luminance component of a subset of the

plurality of pixels based upon the chrominance information of those same pixels as taught by

Weston "...to reduce or eliminate this residual cross talk between luminance and chrominance

signals.", column 1, line 33.

Allowable Subject Matter

26.   **Claims 5 – 7** and **14 – 16** are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

27.   The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 5 – 7 and 14 – 16 the prior art essentially teaches the functional

elements of FIG. 1 of the examined application, including applying a high pass filter to at least

one chrominance component of a color image to compute at least one high pass filtered

chrominance component, adjusting a luminance component of the color image based upon the at

least one high pass filtered chrominance component, generating an output image based upon the

adjusted luminance component, combining multiple high pass filtered chrominance components

into a single chrominance component before adjusting the luminance component, applying a

high pass filter to a luminance component of the color image to compute a high pass filtered

luminance component; and weighting the at least one high pass filtered chrominance component

by a weighting factor based upon the high pass filtered luminance component. However, the

prior art does not teach any further specifics of the weighting function and associated magnitude

comparisons as disclosed in the examined application.

Conclusion

28.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578.

The examiner can normally be reached Monday - Friday 8:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner (SPE), Art Unit 2624